No. 749,202. PATENTED JAN. 12, 1904.

A. KLAY.

EXPANSIBLE MANDREL.

APPLICATION FILED FEB. 2, 1903.

NO MODEL.

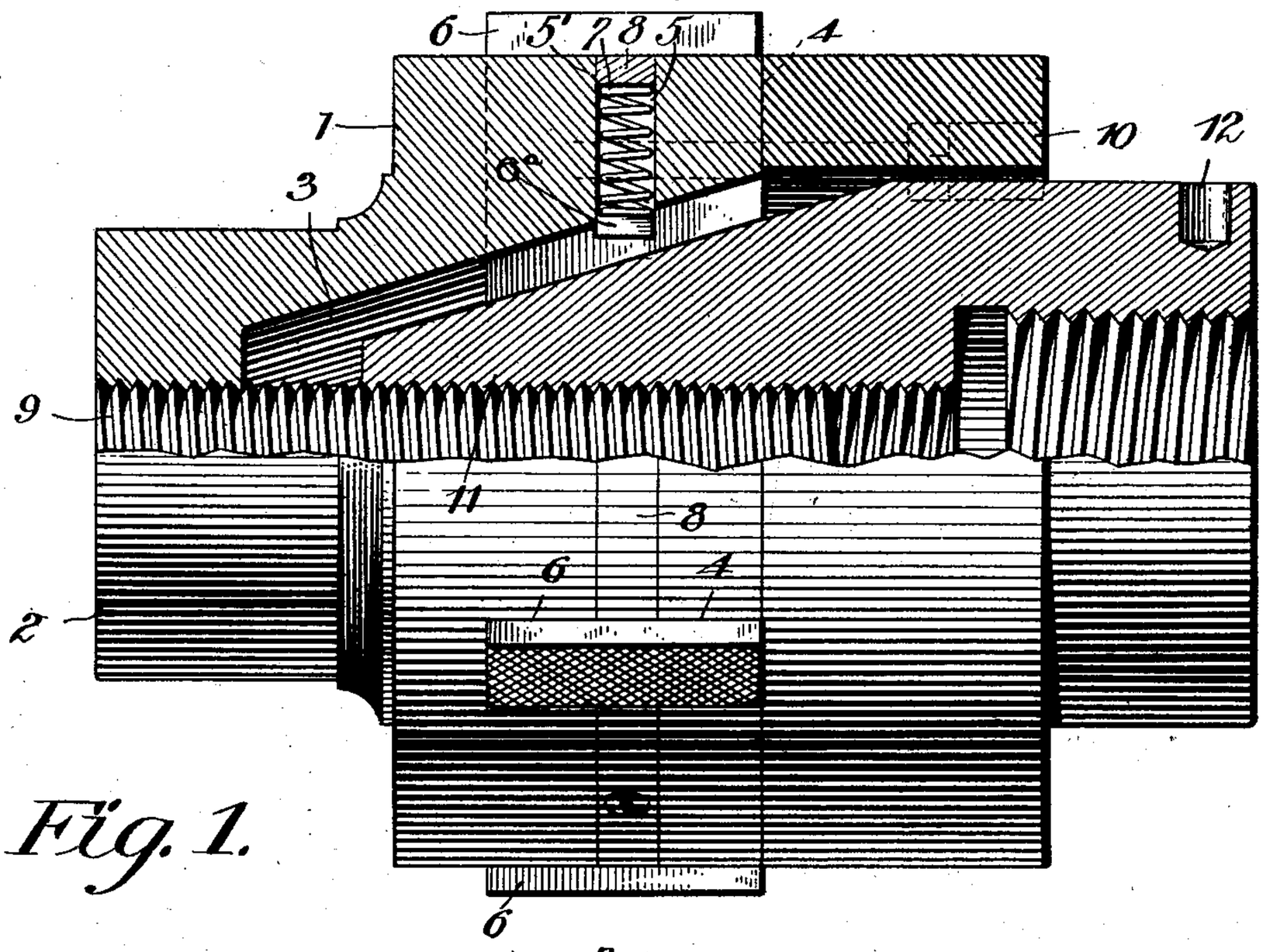

Fig. 1.

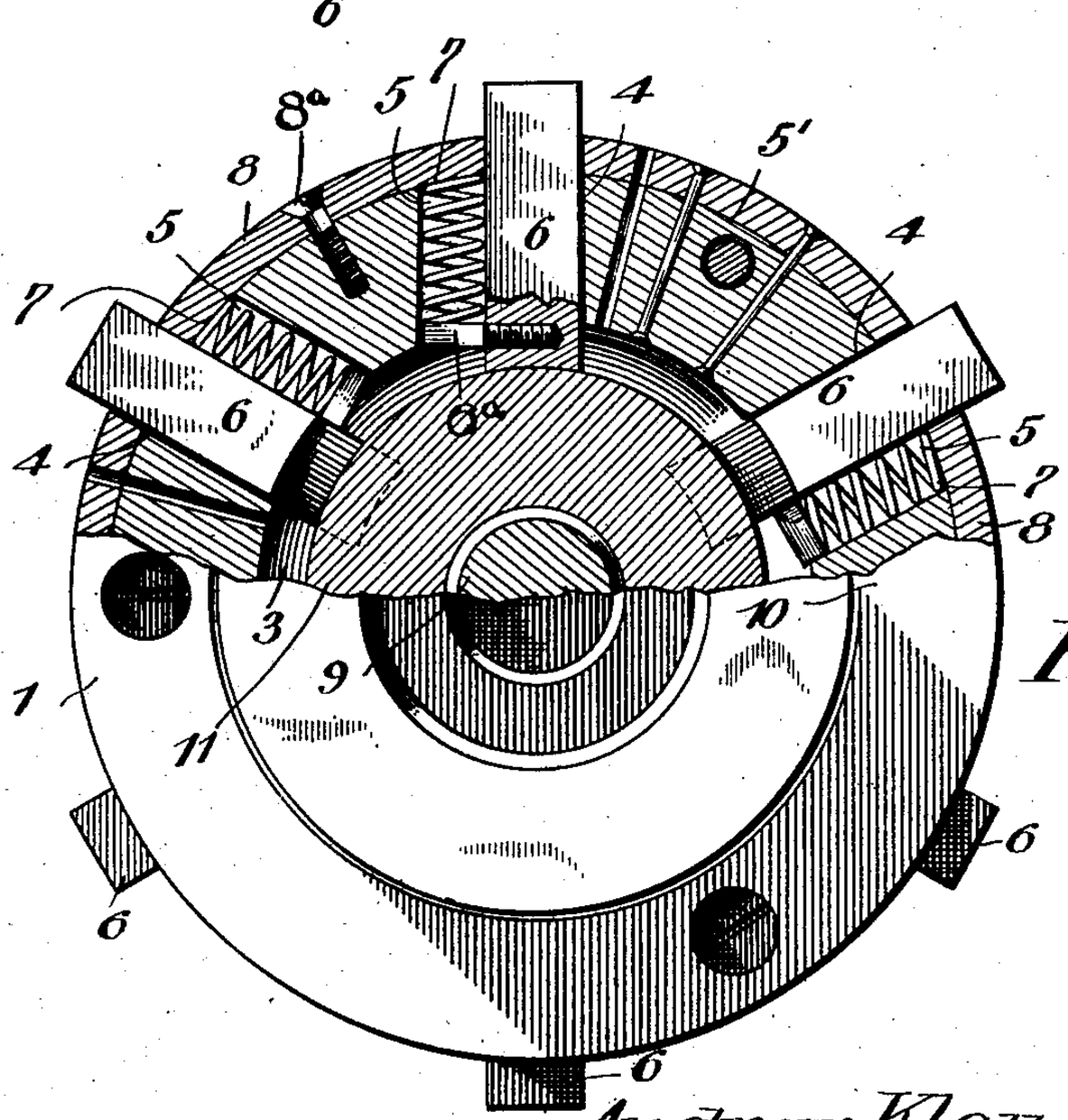

Fig. 2.

Witnesses
E. F. Stewart
Baxter Morton.

Andrew Klay, Inventor:
by C. A. Snow & Co
Attorneys

No. 749,202. Patented January 12, 1904.

UNITED STATES PATENT OFFICE.

ANDREW KLAY, OF BLUFFTON, OHIO.

EXPANSIBLE MANDREL.

SPECIFICATION forming part of Letters Patent No. 749,202, dated January 12, 1904.

Application filed February 2, 1903. Serial No. 141,523. (No model.)

To all whom it may concern:

Be it known that I, ANDREW KLAY, a citizen of the United States, residing at Bluffton, in the county of Allen and State of Ohio, have invented a new and useful Expansible Mandrel, of which the following is a specification.

My invention relates to expansible mandrels, more particularly to expansible mandrels having the jaws arranged radially and adapted to support pipes or tubes into the interior of which the mandrel is adapted to pass.

The object of my invention is to improve the construction and operation of expansible mandrels of the type specified by making them simple in operation, easy to assemble and disassemble, less liable to wear and become loose, and to protect the working parts as completely as possible from dirt.

With these and other objects in view, which will appear as the invention is more fully disclosed, my invention consists in the novel construction and combination of parts of an expansible mandrel hereinafter described, and shown in the accompanying drawings, in which—

Figure 1 is a view, partly in side elevation and partly in longitudinal section, of an expansible mandrel constructed in accord with this invention. Fig. 2 is a view, partly in end elevation from the right end of Fig. 1 and partly in transverse section, of the expansible mandrel.

Both of the above-mentioned figures have corresponding parts designated by the same characters of reference throughout.

Referring to the drawings by reference characters, 1 designates a jaw-casing of cylindrical form having one end reduced in diameter to form a hub 2 and having an interior chamber 3 of conical form. Extending through the wall of the casing 1 are a plurality of radially-disposed slots 4, each of which is open at one end, as shown. Each of the slots 4 is provided on one side with a recess 5, the purpose of which will presently be explained. Circumferentially arranged around the casing 1 on its outer surface is a shallow groove 5′, which registers with the recesses 5.

6 6, &c., represent jaws slidably mounted in the slots 4 and provided on one side with lugs corresponding in position to the recesses 5 in the slots. Lying in the recesses 5 are a series of springs 7 7 of the usual spiral type, having their inner ends against the lugs 6^a, provided on the jaws 6 6, &c., and being retained in position by plates 8 8, &c., of segmental form which are secured by screws 8^a in the groove on the outside of the casing 1. Axially mounted in the casing 1 and rigidly fastened to the hub 2 is a threaded pin or shaft 9.

10 designates a sleeve whose internal diameter is slightly larger than the base of the conical chamber 3 in the casing and whose external diameter is the same as that of the casing. The sleeve 10 is mounted at the rear of the casing 1, as shown, and is secured in position by means of screws countersunk in the sleeve to afford holes for the engagement of lugs upon a spanner or wrench. The sleeve 10 serves to retain the jaws in position in the slots provided therefor in the casing by closing the open ends of the slots and also to partially support the operating-cone, presently to be described, and to shield the working parts of the expansible mandrel from dust and dirt.

11 designates a cone whose tapered portion corresponds in size and taper to the chamber in the casing 1, which is adapted to slide easily in the sleeve 10. In its forward portion the cone 11 is provided with a socket threaded to correspond to the pin which is mounted in the hub 2. In the rear of the cone is provided a socket of larger diameter, which is threaded or otherwise adapted to fit the spindle of a lathe. In order to furnish convenient means of turning the cone in the casing, depressions 12 12, &c., are provided on its outer surface near its rear end, into which suitable lugs provided on a spanner are fitted.

The operation of my improved expansible mandrel is very simple, as will readily be understood from the foregoing description and the accompanying drawings.

When it is desired to grip a pipe or tube for cutting screw-threads or any other purpose, the expansible mandrel is introduced into the end of the pipe and the cone 11 is forced into the chamber in the casing by rotating it. The screw-threads in the socket at

the forward end of the cone and those on the pin axially disposed in the casing cause the cone to travel inward, bringing its tapered end in contact with the inner ends of the jaws 6 6, &c., and forcing them outward until their outer ends engage with a sufficient degree of firmness the inner surface of the pipe or tube.

It will be seen that the means of securing the parts of the expansible mandrel together is such that they may be readily assembled or disassembled and that the inner working parts where there is any friction are almost entirely protected from dust and dirt. It will also be noted that in causing the expansible mandrel to engage and disengage with tubes or pipes the number of movements necessary is a minimum, the mere relative rotation of the cone and the casing in forward or backward direction, as the case may be, being sufficient to cause the expansible mandrel to engage or disengage with the tube.

Having now described in detail the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination in an expansible mandrel, of a hollow cylindrical jaw-casing, slots radially disposed in said casing and having one end open, jaws slidably mounted in said slots, an actuating-cone having a cylindrical base, a sleeve having a cylindrical opening rigidly secured to one end of said jaw-casing and snugly surrounding the case of said cone, said sleeve forming retaining means for said jaw and forming a shield for excluding dirt from the interior of the mandrel.

2. The combination in an expansible mandrel, of a jaw-casing, jaws slidably mounted in slots in the wall of said casing, each of said jaws having a lug projecting laterally therefrom, recesses provided in said casing-wall for said lugs to move in, springs seated in said recesses and pressing against said lugs and retention-plates for said springs which are removably mounted in seats on the external surface of said casing.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ANDREW KLAY.

Witnesses:
C. M. STEINGRAVER,
H. J. CALL.